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10/625,328	07/23/2003	Sebastien Weitbruch	PD020074	7767

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EXAMINER	
CASCHERA, ANTONIO A	
ART UNIT	PAPER NUMBER
2628	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/625,328	WEITBRUCH ET AL.	
	Examiner	Art Unit	
	Antonio A. Caschera	2628	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *30 April 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-6 and 17-25* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6 and 17-25* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *05 August 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Priority

1. Acknowledgment is made of applicant's claim for foreign priority under 35 U.S.C. 119(a)-(d). The certified copy has been filed in the pending application.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1, 2, 4-6, 17, 18, 21-23 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lin (U.S. Patent 6,421,466 B1) in view of Frey (U.S. Patent 5,925,875).

In reference to claims 1 and 17, Lin discloses a method for processing video data (see column 1, lines 5-8 and column 6, lines 26-31) for display on a display device having a plurality of luminous elements (column 5, lines 61-64 disclose the display as having luminous elements) by applying a dithering function to at least part of said video data (see column 8, lines 18-23). Lin further discloses computing at least one motion vector from said video data (see column 7, lines 1-17) and outputting the vector back into an encoded video stream as a substitute for that block of video data (see column 4, lines 45-49). Although Lin does disclose calculating motion estimation vectors from the video data, Lin does not explicitly disclose changing at least one of the phase, amplitude, spatial resolution and temporal resolution of the dithering in accordance

with the calculated motion vector. Frey discloses an apparatus and method using a dithering device to correct for differences in image detectors (see column 1, lines 13-16). Frey discloses the dithering device filtering an image performing scene-to-scene registration to measure the object space motion and to estimate a dither pattern from that motion (see column 10, lines 33-45 and Figure 12). Also, the filtering in Frey is explicitly disclosed as being a "temporal high pass filter" (see column 3, lines 20-21). Frey further discloses the scene-to-scene registration estimating the dither pattern by shifting a reference image signal relative to a previous image frame by a number of pixels (see column 10, lines 51-53). Note, the Office interprets such shifting of the reference image signal functionally equivalent to a change in spatial resolution of the dither pattern since the dither pattern of Frey is directly related to the correlation of the shifted image with previous image frame data. It would have been obvious to one of ordinary skill in the art at the time the invention was made to implement the dither pattern modification based upon motion estimation techniques of Frey with the dithering and motion vector calculation techniques of Lin in order to adjust the dithering process on a scene-by-scene basis thereby creating a more precise dithering mechanism in video systems (see column 3, lines 51-60 of Frey). Further, in reference to claim 17, Lin further disclsoes a digital signal processor and memory for performing motion estimation (see column 7, lines 18-39 and Figure 5) while Frey discloses a dithering mechanism and signal processor for performing the above disclosed video processing techniques (see column 6, lines 15-25 and Figure 1). The Office interprets such elements as functionally equivalent to Applicant's dithering and motion estimation means.

In reference to claims 2 and 18, Lin and Frey disclose all of the claim limitations as applied to claims 1 and 17 respectively above. Frey further discloses the scene-to-scene

registration estimating the dither pattern by shifting a reference image signal relative to a previous image frame by a number of pixels (see column 10, lines 51-53). Note, the Office interprets such shifting of the reference image signal functionally equivalent to a change in spatial resolution of the dither pattern since the dither pattern of Frey is directly related to the correlation of the shifted image with previous image frame data. Further, the Office interprets the shifting of Frey to inherently provide shifting in two dimensions (x, y or 2D dimensions of screen space, see also, column 12, lines 43-48) and since Frey discloses comparing the current image to a previous image frame, the Office interprets Frey to also disclose the dithering to incorporate a single temporal dimension. It would have been obvious to one of ordinary skill in the art at the time the invention was made to implement the dither pattern modification based upon motion estimation techniques of Frey with the dithering and motion vector calculation techniques of Lin in order to adjust the dithering process on a scene-by-scene basis thereby creating a more precise dithering mechanism in video systems (see column 3, lines 51-60 of Frey).

In reference to claims 4 and 20, Lin and Frey disclose all of the claim limitations as applied to claim 1 above. Since Lin discloses that the "Y" or luminous component of the pixel data is kept throughout the pixel manipulation processing (see column 8, lines 12-14), the Office interprets Lin to disclose the dithering function based on single luminous elements. Lin discloses wherein said at least one motion vector is defined for each pixel or cell individually (see columns 6-7, lines 40-17 wherein the details of the motion vector computation for each pixel is disclosed). Note, the Office interprets the "pixel" and "cell" elements of claim 20 interchangeable in this context especially in view of claim 6.

In reference to claims 5 and 21, Lin and Frey disclose all of the claim limitations as applied to claims 1 and 17 respectively above in addition, Lin explicitly discloses performing pixel-width reduction from 8 to 6 bits (see column 8, lines 15-18) which the Office interprets equivalent to a 2-bit dithering.

In reference to claims 6 and 22, Lin and Frey disclose all of the claim limitations as applied to claims 1 and 17 respectively above. Lin discloses wherein said at least one motion vector is defined for each pixel or cell individually (see columns 6-7, lines 40-17 wherein the details of the motion vector computation for each pixel is disclosed).

In reference to claim 23, Lin and Frey disclose all of the claim limitations as applied to claim 17 above in addition, Lin discloses the calculated motion vector to represent a difference in locations between two images of a macroblock or a divided frame of an image (see column 1, lines 21-28 and Figure 1). Also, Lin discloses computing at least one motion vector from said video data (see column 7, lines 1-17). Therefore, since the motion vector inherently represents a difference in position of a macroblock from frame to frame images and as shown in Figure 1 (#18 and how the vector shows the shifted to the left and down new position of the "current picture" as compared to the "old picture"), such location is performed on a two dimensional plane thereby inherently carrying two spatial dimensions from the position data.

In reference to claim 25, Lin and Frey disclose all of the claim limitations as applied to claim 17 above in addition, Frey discloses a signal processor performing the motion dithering using shifted image data on a frame-by-frame basis (see column 10, lines 46-65 and Figure 12). Note, the Office interprets the signal processor of Frey to operate functionally equivalent to the controlling means of Applicant's claim. It would have been obvious to one of ordinary skill in

the art at the time the invention was made to implement the dither pattern modification based upon motion estimation techniques of Frey with the dithering and motion vector calculation techniques of Lin in order to adjust the dithering process on a scene-by-scene basis thereby creating a more precise dithering mechanism in video systems (see column 3, lines 51-60 of Frey).

3. Claims 3, 19 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lin (U.S. Patent 6,421,466 B1), Frey (U.S. Patent 5,925,875) and further in view of Correa et al. (EP1136974 A1).

In reference to claims 3 and 19, Lin and Frey disclose all of the claim limitations as applied to claims 1 and 17 respectively above. Neither Lin nor Frey explicitly disclose the dithering function including the application of a plurality of masks or being based upon a plurality of masks. Correa et al. discloses a method for processing video data for display on a display device wherein dithering is applied and the dithering function includes the application of a plurality of masks (see page 9, paragraph 0038). It would have been obvious to one of ordinary skill in the art at the time the invention was made to implement the dithering masks of Correa et al.with the dither pattern modification and motion estimation techniques of Frey and dithering/motion vector calculation techniques of Lin in order in order to enhance the portrayal of grey scale values in video by adding an appropriate mask dither signal to the video signal (see page 2, paragraph 10 of Correa et al.).

In reference to claim 24, Lin and Frey disclose all of the claim limitations as applied to claim 17 above however, neither Lin nor Frey explicitly disclose a gamma function connected to the dithering means to precorrect input signals. Correa et al. discloses a system and method for

processing video data for display on a display device wherein a gamma function means is connected to said dithering means (see paragraph 57 and #10 of Figure 4). It would have been obvious to one of ordinary skill in the art at the time the invention was made to integrate the teachings of Lin and Frey with the gamma processing techniques of Correa et al. in order to compensate for poor image quality pwm techniques in display devices by reducing the perceptibility of quantization noise in displayed video data (see paragraphs 7-8 of Correa et al.).

Response to Arguments

4. Applicant's arguments, see page 6 of Applicant's Remarks, filed 04/30/08, with respect to the objection of claims 6 and 17 have been fully considered and are persuasive. The objection of claims 6 and 17 has been withdrawn since amendments to the claims have remedied the previous issues.

5. Applicant's arguments filed 04/28/08 have been fully considered but they are not persuasive.

In reference to claims 1-6 and 17-25, Applicant argues that since Lin and Frey are directed to different technical fields, that one of ordinary skill in the art would not find it obvious to seek to combine Lin and Frey (see pages 6-7 of Applicant's Remarks). Applicant explicitly argues that since Lin is classified in class 382 and Frey in class 250 and therefore such references are from two disparate fields of endeavor (see pages 6-7 of Applicant's Remarks).

In response, the Office disagrees with Applicant's remarks that Lin and Frey cannot be combined in view of a 35 USC 103 obviousness-type rejection. In particular, in response to Applicant's argument that Lin and Frey are nonanalogous art, it has been held that a prior art

reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the applicant was concerned, in order to be relied upon as a basis for rejection of the claimed invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In this case, Lin is directed to the field of utilizing motion estimation in analyzation of video data while Frey is directed to reducing noise patterns in a dithering mechanism of an image forming apparatus. Both references are therefore herein seen to be directly applicable to Applicant's invention which deals with the processing of video data which entails dithering and motion vector computations to modify the video data. Further the mere fact that the references are classified in separate class/subclasses does not necessarily mean that their inventions are directed to completely different subject matter or inventions. This can be seen from the above mentioned Lin and Frey, whereby although such references are classified in different areas, their inventions both deal with dithering image data (whereby video data can be further interpreted as a sequence of image data) as further suggested by Applicant's remarks (see 2nd paragraph, lines 1-2 of page 7 of Applicant's Remarks). Therefore, the Office interprets the combination of Lin and Frey to be just.

In reference to claims 1-6 and 17-25, Applicant further argues that the references teach dithering for different purposes (see page 7 of Applicant's Remarks) and that it would not have been obvious to apply Frey to the problem of using dithering as a means of increasing the number of video levels of a pulse width modulated display to refine the gray scale portrayal of video pictures (see page 7 of Applicant's Remarks).

In response, the Office states that the combination of Lin and Frey teach all of the limitations of the claims. The combination of Lin and Frey are combined in such a way to cover

the limitations as they are recited in the claims so that combination of teachings of Lin and Frey are utilized. In other words, the combination of Lin and Frey is just since they both are directed towards dithering. The exact reasoning upon why each reference is performing such dithering is not relevant because if one examines each reference solely in such a manner, a piece-wise analysis of each reference is made. Such is the case with Applicant's further arguments of Frey, as seen above which, in response to Applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.,* 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). Therefore, the Office interprets the combination of Lin and Frey to be just.

Also, in reference to claims 1-6 and 17-25, Applicant argues that the 35 USC 103 rejection does not provide support for the obviousness of the combination for Lin and Frey (see page 8 of Applicant's Remarks). Also, Applicant seems to argue against Frey and features of the claim (see page 8 of Applicant's Remarks) however such limitations were explicitly stated as taught by Lin (see the rejection of claims 1 and 17 above).

In response to Applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988)and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, Lin is directed to the field of utilizing motion estimation in analyzation of video data

while Frey is directed to reducing noise patterns in a dithering mechanism of an image forming apparatus. Both references are therefore herein seen to be directly applicable to Applicant's invention which deals with the processing of video data which entails dithering and motion vector computations to modify the video data. Further, the above rejection of the claims has explicitly pointed to Lin to disclose the claimed limitation of applying a dithering function (see above rejection of claims 1 and 17), and therefore such teachings are not explicitly required in the Frey reference, as argued by Applicant. Frey is utilized, as discussed above, to teach the limitation of changing spatial resolution of dithering as Frey discloses a dithering device filtering an image performing scene-to-scene registration to measure an object space motion and to estimate a dither pattern from that motion (see column 10, lines 33-45 and Figure 12). Also, the filtering in Frey is explicitly disclosed as being a "temporal high pass filter" (see column 3, lines 20-21). Frey further discloses the scene-to-scene registration estimating the dither pattern by shifting a reference image signal relative to a previous image frame by a number of pixels (see column 10, lines 51-53). Note, the Office interprets such shifting of the reference image signal functionally equivalent to a change in spatial resolution of the dither pattern since the dither pattern of Frey is directly related to the correlation of the shifted image with previous image frame data. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to implement the dither pattern modification based upon motion estimation techniques of Frey with the dithering and motion vector calculation techniques of Lin in order to adjust the dithering process on a scene-by-scene basis thereby creating a more precise dithering mechanism in video systems (see column 3, lines 51-60 of Frey).

In reference to claims 1-6 and 17-25, Applicant also states that the Examiner has not explained how Frey changes at least one of phase, amplitude or temporal resolution as claimed and Applicant further argues that Frey does not disclose the step of displaying the processed video (see page 9 of Applicant's Remarks).

In response, the Office points out the specific claim language of claims 1 and 17, which explicitly states, "...changing at least one of the phase, amplitude, spatial resolution and temporal resolution of said dithering function..." (see claim 1) and "...wherein at least one of a phase, an amplitude, a spatial resolution and a temporal resolution of said dithering function is changeable..." (see claim 17). The Office points to the specific "at least one of" language which allows the Office to apply a prior art reference that teaches one or more of such parameters/elements. The Office has disclosed above, with the teachings of Frey, that Frey discloses a dithering device filtering an image performing scene-to-scene registration to measure an object space motion and to estimate a dither pattern from that motion (see column 10, lines 33-45 and Figure 12). Also, the filtering in Frey is explicitly disclosed as being a "temporal high pass filter" (see column 3, lines 20-21). Frey further discloses the scene-to-scene registration estimating the dither pattern by shifting a reference image signal relative to a previous image frame by a number of pixels (see column 10, lines 51-53). Note, the Office interprets such shifting of the reference image signal functionally equivalent to a change in spatial resolution of the dither pattern since the dither pattern of Frey is directly related to the correlation of the shifted image with previous image frame data. Therefore, it can be seen that Frey, at least, teaches the parameter of spatial resolution while further teaching the parameter of "temporal resolution" since the dithering is performed via a "temporal high pass filter." Also with reference

to the outputting limitation of the claims, it can be seen from the above rejection of claims 1 and 17 that Lin discloses outputting the processed data back into the video stream. Therefore, is not the required for Frey to disclose such a limitation since it is the combination of Lin and Frey which disclose all of the claim features as recited. Therefore, the Office interprets the combination of Lin and Frey to disclose all of the limitations of the claims.

Lastly, in reference to claims 3, 19 and 24, Applicant seems to argue the combination of the Correa reference with Lin and Frey (see page 9 of Applicant's Remarks).

In response to Applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988)and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, , Lin is directed to the field of utilizing motion estimation in analyzation of video data, Frey is directed to reducing noise patterns in a dithering mechanism of an image forming apparatus while Correa is directed towards applying a dithering function for processing video data for display. All of the references are seen to be related to the dithering of graphical data and are further seen to be directly applicable to Applicant's invention which deals with the processing of video data which entails dithering and motion vector computations to modify the video data. It would have been obvious to one of ordinary skill in the art at the time the invention was made to implement the dithering masks of Correa et al.with the dither pattern modification and motion estimation techniques of Frey and dithering/motion vector calculation

techniques of Lin in order in order to enhance the portrayal of grey scale values in video by adding an appropriate mask dither signal to the video signal (see page 2, paragraph 10 of Correa et al.). Further, it would have been obvious to one of ordinary skill in the art at the time the invention was made to integrate the teachings of Lin and Frey with the gamma processing techniques of Correa et al. in order to compensate for poor image quality pwm techniques in display devices by reducing the perceptibility of quantization noise in displayed video data (see paragraphs 7-8 of Correa et al.). These reasons for combining Correa with Lin and Frey are valid and reasonable as understood by one of ordinary skill in the art and therefore the Office interprets the combination of Lin, Frey and Correa to be just.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Antonio Caschera whose telephone number is (571) 272-7781. The examiner can normally be reached Monday-Thursday and alternate Fridays between 7:00 AM and 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kee Tung, can be reached at (571) 272-7794.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

Washington, D.C. 20231

or faxed to:

571-273-8300 (Central Fax)

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 Customer Service Office whose telephone number is (571) 272-2600.

/Antonio A Caschera/

Examiner, Art Unit 2628

Temporary Full Signatory Authority

8/1/08